

**WHAT IS CLAIMED IS:**

1 1. An idle speed control system for a vehicle including an  
2 internal combustion engine coupled to an automatic  
3 transmission which has a torque converter, the idle speed  
4 control system comprising:  
5 a sensor operative to detect a parameter based on a  
6 torque converter speed ratio and generate a signal  
7 indicative of the parameter detected; and  
8 a controller programmed to:  
9 determine basic idle speed; and  
10 determine a target idle speed by correcting the basic  
11 idle speed based on the signal when the automatic  
12 transmission is in a drive range in engine idling condition.

1 2. The idle speed control system as claimed in claim 1,  
2 wherein the controller is programmed to determine a  
3 correction value so as to increase the target idle speed as  
4 the torque converter speed ratio changes from zero toward  
5 one.

1 3. The idle speed control system as claimed in claim 1,  
2 wherein the parameter is a vehicle speed.

1 4. The idle speed control system as claimed in claim 1,  
2 wherein the parameter is the torque converter speed ratio.

1 5. The idle speed control system as claimed in claim 3,  
2 wherein the controller is programmed to determine a  
3 correction value so as to increase the target idle speed as  
4 the vehicle speed increases.

1 6. The idle speed control system as claimed in claim 1,  
2 wherein the controller is programmed to determine a

3 plurality of correction values for correcting the basic idle  
4 speed which correspond to different values of the basic idle  
5 speed.

1 7. The idle speed control system as claimed in claim 6,  
2 wherein the controller is programmed to store a plurality of  
3 tables corresponding to the different values of the basic  
4 idle speed, the tables indicating the correction values,  
5 respectively.

1 8. The idle speed control system as claimed in claim 6,  
2 wherein the controller is programmed to:  
3       store a table corresponding to a reference speed and  
4       indicating the correction value;  
5       correct the parameter based on the basic idle speed;  
6       and  
7       retrieve the correction value from the table on the  
8       basis of the corrected parameter.

1 9. The idle speed control system as claimed in claim 8,  
2 wherein the controller is programmed to correct the  
3 parameter by multiplying the parameter by a ratio between  
4 the reference speed and the basic idle speed.

1 10. The idle speed control system as claimed in claim 6,  
2 wherein the controller is programmed to:  
3       store a table corresponding to a reference speed and  
4       indicating the correction value;  
5       retrieve the correction value from the table; and  
6       correct the retrieved correction value based on the  
7       basic idle speed.

1 11. The idle speed control system as claimed in claim 10,  
2 wherein the controller is programmed to correct the  
3 retrieved correction value by multiplying the retrieved  
4 correction value by a ratio of a difference between a drive  
5 range basic air flow amount at the basic idle speed and a  
6 neutral range basic air flow amount at the basic idle speed,  
7 to a difference between a drive range basic air flow amount  
8 at the reference speed and a neutral range basic air flow  
9 amount at the reference speed.

1 12. A method for controlling an engine idle speed in an  
2 internal combustion engine of a vehicle, the internal  
3 combustion engine being coupled to an automatic transmission  
4 having a torque converter, the method comprising:  
5 determining basic idle speed when the automatic  
6 transmission is in a drive range in engine idling condition;  
7 detecting a parameter based on a torque converter speed  
8 ratio; and  
9 determining a target idle speed by correcting the basic  
10 idle speed based on the parameter.

1 13. The method as claimed in claim 12, wherein the  
2 correcting operation comprises determining a correction  
3 value so as to increase the target idle speed as the torque  
4 converter speed ratio changes from zero toward one.

1 14. The method as claimed in claim 12, wherein the  
2 parameter is a vehicle speed.

1 15. The method as claimed in claim 12, wherein the  
2 parameter is the torque converter speed ratio.

1 16. The method as claimed in claim 14, wherein the  
2 correcting operation comprises determining a correction  
3 value so as to increase the target idle speed as the vehicle  
4 speed increases.

1 17. The method as claimed in claim 12, wherein the  
2 correcting operation comprises determining a plurality of  
3 correction values for correcting the basic idle speed which  
4 correspond to different values of the basic idle speed.

1 18. The method as claimed in claim 17, further comprising  
2 providing a plurality of tables which corresponds to the  
3 different values of the basic idle speed and indicates the  
4 correction values, respectively.

1 19. The method as claimed in claim 17, further comprising  
2 providing a table which corresponds to a reference speed and  
3 indicates the correction value, correcting the parameter  
4 based on the basic idle speed, and retrieving the correction  
5 value from the table on the basis of the corrected parameter.

1 20. The method as claimed in claim 19, wherein the  
2 correcting operation comprises correcting the parameter by  
3 multiplying the parameter by a ratio between the reference  
4 speed and the basic idle speed.

1 21. The method as claimed in claim 17, further comprising  
2 providing a table which corresponds to a reference speed and  
3 indicates the correction value, the controller being  
4 programmed to retrieve the correction value from the table  
5 and correct the retrieved correction value based on the  
6 basic idle speed.

1 22. The method as claimed in claim 21, wherein the  
2 correcting operation comprises correcting the retrieved  
3 correction value by multiplying the retrieved correction  
4 value by a ratio of a difference between a drive range basic  
5 air flow amount at the idle speed and a neutral range basic  
6 air flow amount at the idle speed, to a difference between a  
7 drive range basic air flow amount at the reference speed and  
8 a neutral range basic air flow amount at the reference speed.